STATIONARY SOURCE PERMIT TO CONSTRUCT AND OPERATE

In compliance with the Federal Clean Air Act and the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution,

INGENCO – King and Queen Facility
2250 Dabney Road
Richmond, VA 23230
Registration No.: 52148
County-Plant ID: 097-0020

is authorized to construct and operate:

a high landfill gas fraction dual-fuel electrical power generating facility

located at:

400 Iris Road, Little Plymouth, Virginia 23091

in accordance with the Conditions of this permit.

Approved on: September TBD, 2007

Robert J. Weld
Deputy Regional Director,
Department of Environmental Quality

Permit consists of 19 pages.
Permit Conditions 1 to 47
Source Testing Report Format

INTRODUCTION

This permit approval is based on the permit application dated May 23, 2007 and revision sheet on July 2, 2007. Any changes in the permit application specifications or any existing facilities that alter the impact of the facility on air quality may require a permit. Failure to obtain such a permit prior to construction may result in enforcement action.

Words or terms used in this permit shall have meanings as provided in 9 VAC 5-10-10 of the State Air Pollution Control Board Regulations for the Control and Abatement of Air Pollution. The regulatory reference or authority for each condition is listed in parentheses () after each condition.

Annual requirements to fulfill legal obligations to maintain current stationary source emissions data will necessitate a prompt response by the facility to requests by the DEQ or the Board for information to include, as appropriate: process and production data; changes in control equipment; and operating schedules. Such requests for information from the DEQ will either be in writing or by personal contact.

The availability of information submitted to the DEQ or the Board will be governed by applicable provisions of the Freedom of Information Act, §§ 2.2-3700 through 2.2-3714 of the Code of Virginia, § 10.1-1314 (addressing information provided to the Board) of the Code of Virginia, and 9 VAC 5-170-60 of the State Air Pollution Control Board Regulations. Information provided to federal officials is subject to appropriate federal law and regulations governing confidentiality of such information.

PROCESS REQUIREMENTS

1. **Equipment List -** Equipment at this facility consists of the following:

Equipment to be Constructed				
Reference No.	**Equipment Description**	**Rated Capacity**	**Federal Requirements**	
A1-H6	Forty-eight (48) dual-fuel diesel engines (A1-H6), each driving a 350 kW generator. The engines are arranged in eight groups of six engines each. Each group shall have a separate exhaust stack (S1-S8), with S1 serving group A1-A6, S2 serving group B1-B6, etc. The phased construction plan is to install thirty six (36) dual-fuel diesel engines (A1-F6) initially, then twelve (12) dual-fuel diesel engines (G1-H6) in June 1, 2011.	550 HP and 3.57 MMBtu/hr heat input each, total for 48 engines, 171.36 MMBtu/hr heat input.	NSPS IIII if modified.	
T-1	Oil Storage Tank	30,000 gallons		
T-2	Oil Storage Tank	30,000 gallons		

(9 VAC 5-80-1100)

2. **Emission Controls** – Nitrogen Dioxide emissions from the 48 dual-fuel diesel engines (A1-H6) shall be controlled by the original equipment manufacturer's air-to-fuel ratio control, turbo-charging and charge-air cooling systems or a change to the engine control module (ECM). The air-to-fuel ratio shall be controlled by a separate engine control module for each engine.
(9 VAC 5-50-260)

3. **Emission Controls** – Nitrogen Dioxide emissions from the 48 dual-fuel diesel engines (A1-H6) shall also be controlled by supplementary inlet charge-air water-to-air cooling and oversized inlet charge and exhaust ducts. The cooling system shall be capable of maintaining an hourly average inlet charge-air temperature not greater than 140˚F. Water shall be provided continuously to each engine inlet charge-air cooler and each engine shall have independent temperature measurement capabilities. The inlet charge-air cooler shall be provided with adequate access for inspection and shall be in operation when any of the 48 dual-fuel diesel engines (A1-H6) are operating.
(9 VAC 5-50-260 and 9 VAC 5-80-1180 A 1)

4. **Emission Controls** – Nitrogen Dioxide emissions from the 48 dual-fuel diesel engines (A1-H6) shall be controlled by the combustion of treated landfill gas whenever any of the engines are operated in the dual fuel mode. The extent to which the dual fuel operations control Nitrogen Dioxide emissions is dependent upon the heat substitution rate supplied by the treated landfill gas. To ensure that a stable supply of treated landfill gas is being diverted to the facility, the facility shall install and operate a device to monitor and record the process of diverting the collected landfill gas from the landfill gas collection and control system in order to ensure that the process of diverting the landfill gas is operated in accordance with the facilities' standard operating procedures.
(9 VAC 5-50-260 and 9 VAC 5-80-1180 A.1)

5. **Emission Controls** – Carbon Monoxide emissions from the 48 dual-fuel diesel engines (A1-H6) shall be controlled by limiting the ratio of treated landfill gas heat input to total fuel heat input to not greater than 96% for each period of continuous dual-fuel operation. This is accomplished by setting the assumed liquid fuel flow in MMBtus to the compliment to the assumed gas flow rate in Btus. An increase in the heat input ratio to the 48 dual-fuel diesel engines (A1-H6) to greater than 96% Gas Fraction or a change to the engine control module (ECM) may require a permit to modify and operate. The facility may, on prior approval from the Piedmont Regional Office, operate for short periods at heat input ratios greater than 96% or a change to the engine control module (ECM) for the purposes of research and development
(9 VAC 5-80-1180 and 9 VAC 5-170-160)

6. **Emission Controls** – Any uncontrolled venting of landfill gas from the 48 dual-fuel diesel engines (A1-H6), the landfill gas treatment system, or the treated landfill gas transport system is prohibited. All treated landfill gas shall be purged from the treated landfill gas transport system prior to shutting down any engine after operating in the dual fuel mode. All atmospheric vents in the treated landfill gas transport system shall be controlled by a lockout-tag-out system or by installing and operating a device to divert the emissions from all vents to an approved landfill gas control system.
(9 VAC 5-50-260, 9 VAC 5-50-410, 9 VAC 5-80-1180 and 9 VAC 5-170-160)

7. **Emission Controls** – Particulate Matter and Volatile Organic Compounds emissions from the 48 dual-fuel diesel engines (A1-H6) shall be controlled by proper engine maintenance practices. The engines shall be repaired and maintained to prevent excess emissions of particulate matter (in the form of PM and PM-10) and Volatile Organic Compounds.
(9 VAC 5-50-260 and 9 VAC 5-80-1180)

8. **Emission Controls** – All components of the treated landfill gas control system, which consists of each one of the 48 dual-fuel diesel engines (A1-H6), the treated landfill gas transport system, and the landfill gas treatment system shall be in operation whenever the facility is operating the engines in a dual fuel mode. If any component of the landfill gas treatment system or treated landfill gas transport system malfunctions, the treated landfill gas transport system shall be shut down and all untreated landfill gas shall be diverted to the remaining engines or to the utility flare(s). If any engine or set of engines malfunctions, that portion of treated landfill gas shall be diverted to the remaining engines, or to the utility flare(s).
(9 VAC 5-50-260 and 9 VAC 5-50-410)

9. **Monitoring Devices** - The facility shall be equipped with devices to continuously measure and record the consumption of treated landfill gas, distillate oil and bio-diesel fuel oil by the 48 dual-fuel diesel engines (A1-H6). Each monitoring device shall be installed, maintained, calibrated and operated in accordance with approved procedures which shall include, as a minimum, the manufacturer's written requirements or recommendations. Each monitoring device shall be provided with adequate access for inspection and shall be in operation when the facility is operating.
(9 VAC 5-80-1180, 9 VAC 5-50-20 C, 9 VAC 5-50-260 and 9 VAC 5-50-410)

10. **Monitoring Devices** - Each of the 48 dual-fuel diesel engines (A1-H6) shall be equipped with a device to continuously measure engine inlet charge-air temperature. Each monitoring device shall be installed, maintained, calibrated and operated in accordance with approved procedures which shall include, as a minimum, the manufacturer's written requirements or recommendations. Each monitoring device shall be provided with adequate access for inspection and shall be in operation when the 48 dual-fuel diesel engines are operating.
(9 VAC 5-80-1180, 9 VAC 5-50-20 C and 9 VAC 5-50-260)

11. **Monitoring Devices** - The facility shall be equipped with devices to continuously measure the pressure within the treated landfill gas transport system. At a minimum, devices shall be located just before and just after the 10-micron filter and after the completed treatment process. Each monitoring device shall be installed, maintained, calibrated and operated in accordance with approved procedures which shall include, as a minimum, the manufacturer's written requirements or recommendations. Each monitoring device shall be provided with adequate access for inspection and shall be in operation when the facility is operating.
(9 VAC 5-80-1180, 9 VAC 5-50-20 C, 9 VAC 5-50-260 and 9 VAC 5-50-410)

12. **Monitoring Device Observation** - The facility shall log observations of landfill gas fraction and inlet charge air temperature for each engine (A1-H6) when operating (engines noted as "OFF" when not running). The log shall contain a minimum of hourly observations processed monthly and stored onsite. The facility will maintain a written log, stored onsite, containing hourly observations for the periods of electronic/computer problems/failure to commence within one hour of an electronic records problem/computer failure. The log shall be used for emissions calculations during periods where some or all electronic data are not available. **In the case where no electronic information or manual records are available, the facility will calculate emissions using worse case scenario**.
(9 VAC 5-50-50 F)

13. **Monitoring Device Observation** - The monitoring devices used to measure inlet charge-air temperature shall be observed by the facility with a frequency of not less than hourly whenever the engines are operating. The facility shall keep a daily log of the temperature observations from the monitoring devices including the time the observation was recorded.
(9 VAC 5-50-50 F)

14. **Monitoring Device Observation** - The monitoring device used to measure the pressure in the treated landfill gas system shall be observed by the facility whenever treated landfill gas is combusted in the engines with a frequency of not less than daily to ensure good performance of the treatment system. The facility shall keep a daily log of the observations from the monitoring device, including the change in pressure across the 10-micron filter.
(9 VAC 5-50-50 F and 9 VAC 5-50-410)

15. **Landfill Gas Gross Calorific Value** - The facility shall determine the heat value of the Treated LFG on a weekly basis, using the following formula:

$$\text{Heat Value}\left(\frac{\text{BTU}}{\text{cf}}\right)=\left(\frac{\%\,\text{Methane}}{100}\right)\text{x}\ \ 992.65\,\frac{\text{BTU}}{\text{cf}}$$

A log of the values shall be maintained. The methane-measuring device shall be maintained, calibrated and operated in accordance with approved procedures which shall include, as a minimum, the manufacturer's written requirements or recommendations. The measuring device shall be provided with adequate access for inspection.
(9 VAC 5-80-1180, 9 VAC 5-50-20 C and 9 VAC 5-50-260)

16. **Landfill Gas Treatment Equipment -** The entire landfill gas treatment system as specified in Condition 20 is required to comply with 40 CFR 60.752 (b)(2)(iii) and shall be installed and operational whenever landfill gas is being transferred to any of the 48 dual-fuel diesel engines (A1-H6). Verification of satisfactory operation of treatment equipment shall, at a minimum, include certification that manufacturer's written requirements or recommendations for installation, operation, and maintenance of the devices shall be followed.
(9 VAC 5-50-20, 9 VAC 5-50-260 and 9 VAC 5-50-410)

OPERATING/EMISSION LIMITATIONS

17. **Fuel** - The approved fuels for the 48 dual-fuel diesel engines (A1-H6) are number 1 and number 2 - distillate oil, bio-diesel fuel oil and treated landfill gas. A change in the fuels may require a permit to modify and operate.
(9 VAC 5-80-1180)

18. **Fuel Throughput** - The facility shall limit consumption of fuel such that neither the total Nitrogen Dioxide or total Carbon Monoxide emissions exceed 240 tons, for any consecutive 12-month period. The emissions shall be calculated monthly as the sum of each consecutive 12-month period according to the following equations:

Given:

$$\text{NOx}=\frac{\left[\left(\frac{\left(\text{A}\times\text{CV}_{\text{liq}}\right)\times 1\text{MMBtu}}{1{,}000{,}000\text{Btu}}\right)\times\text{ENOx(l)1lbs/MMBtu}\right]+\left[\left(\frac{\left(\text{B}\times\text{CV}_{\text{LFG}}\right)\times 1\text{MMBtu}}{1{,}000{,}000\text{Btu}}\right)\times\text{ENOx (LFG)}\times\text{lb/MMBtu}\right]}{2000\text{lb/ton}}$$

$$\text{CO}=\frac{\left[\left(\frac{\left(\text{A}\times\text{CV}_{\text{liq}}\right)\times 1\text{MMBtu}}{1{,}000{,}000\text{Btu}}\right)\times\text{ECO(l)1lbs/MMBtu}\right]+\left[\left(\frac{\left(\text{B}\times\text{CV}_{\text{LFG}}\right)\times 1\text{MMBtu}}{1{,}000{,}000\text{Btu}}\right)\times\text{ECO (LFG)}\times\text{lb/MMBtu}\right]}{2000\text{lb/ton}}$$

When:

A = gallons of liquid fuel consumed as distillate oil or bio-diesel fuel oil.
B = cubic feet of landfill gas consumed.
CV_{liq} = calorific value (heat content) in Btu/gallon of the corresponding liquid fuel as distillate oil or residual oil as specified in Condition 19.
CV_{LFG} = calorific value (heat content) in Btu/cubic foot of treated landfill gas as determined by Condition 15.

ENOx (l) = Emissions factor for NOx from liquid fuel as shown in the Table Below
ENOx(lfg) = Emissions factor for NOx from landfill gas as shown in the Table below.
ECO(l) = Emissions factor for CO from liquid fuel as shown in the Table below
ECO(lfg) = Emissions factor for CO from landfill gas as shown in the Table below:

Emission Factors

Landfill Gas Substitution Range (NOx)	ENOx(l)	ENOx(lfg)
0%-30%	2.15	- 0.40
31%-80%	1.50	1.50
81%-96%	5.00	0.70
81%-96% (New PCM128 Units)	5.52	0.255
Landfill Gas Substitution Range (CO)	ECO(l)	ECO(lfg)
0%-54%	0.26	5.25
55%-96%	5.60	0.80
81%-96% (New PCM128 Units)	6.385	0.332

Such that:
NOx ≤ 240 tons/yr calculated as the sum of each consecutive 12-month period as a product of the heat input contribution from each fuel source.
CO ≤ 240 tons/yr calculated as the sum of each consecutive 12-month period as a product of the heat input contribution from each fuel source.

Each equation is valid only if the total heat input contribution from treated landfill gas heat input is less than or equal to 96% of the total heat input for any period of continuous dual-fuel operation, expressed as the ratio of treated landfill gas heat input to total fuel heat input (For each period of continuous dual-fuel operation), according to the following equation:

$$HI_{LFG} = \frac{B \times CV_{LFG}}{(A \times CV_{liq}) + (B \times CV_{LFG})} \times 100 \leq 96\%$$

(9 VAC 5-80-1180)

19. **Fuel Specifications** - The fuels shall meet the specifications below:

DISTILLATE OIL which meets the ASTM [D396] specifications for numbers 1 or 2 fuel oil:

Sulfur content per shipment:	0.5%
Average sulfur content:	0.25%
Heat content *:	137,000 BTU/gallon

BIO-DIESEL FUEL OIL:

Sulfur content per shipment:	0.5%
Heat content *:	131,295 BTU/gallon

Treated Landfill Gas:

*Minimum heat content:	350 BTU/scf

* The heat content of each fuel listed shall be used to calculate the facility's emissions as defined by the emission factors and limits found in Conditions 17, 18, 22 and 23.
**The heat content of the Treated Landfill Gas shall be analyzed for Gross Calorific Value using methods outline in Permit Condition 15.
(9 VAC 5-80-1180)

20. **Fuel Specifications** - TREATED LANDFILL GAS shall be that which is produced by the BFI King and Queen Landfill (Registration Number 40920) as that facility is permitted by the Virginia Department of Environmental Quality and has been processed in accordance with 40 CFR60.752 (b)(2)(iii)(C). The landfill gas treatment system, at a minimum, shall be composed of a de-watering process, filtration through a 10-micron filter, and compression. The facility's de-watering process shall consist of a tertiary or polishing tank with a total capacity of 150 gallons. The primary and secondary knockout tanks are located at the BFI King and Queen Landfill (40920). All landfill gas consumed at the permitted facility shall pass through each component of the landfill gas treatment process prior to use in the combustion process.
(9 VAC 5-80-1180)

21. **Fuel Certification -** The facility shall obtain a certification from the fuel supplier with each shipment of distillate oil or bio-diesel fuel oil. Each fuel supplier certification shall include the following:

    a. The name of the fuel supplier;

    b. The date on which the distillate oil or bio-diesel fuel oil was received;

    c. The volume of distillate oil or bio-diesel fuel oil delivered in the shipment;

    d. A statement that the distillate oil complies with the American Society for Testing and Materials specifications [D396-78] for numbers 1 or 2 fuel oil; and

e. The heat value (in Btu/gal) of the distillate oil or bio-diesel fuel oil; and

f. A statement that the sulfur content of the distillate oil or bio-diesel fuel oil does not exceed 0.25 % by weight and 0.5% by weight, respectively.

(9 VAC 5-170-160)

22. **Emission Limits -** Emissions from the operation of any of the 48 dual-fuel diesel engines (A1-H6) when the facility is operated in either the single fuel or the dual fuel mode shall not exceed the limits specified below:

Particulate Matter	0.3	lb/MMBtu
PM-10	0.3	lb/MMBtu
PM-2.5	0.3	lb/MMBtu
Sulfur Dioxide	0.5	lb/MMBtu
Nitrogen Dioxide	2.4	lb/MMBtu
Carbon Monoxide	3.0	lb/MMBtu
Volatile Organic Compounds	0.4	lb/MMBtu

Compliance with the lb/MMBtu limits for PM, PM-10, NOx, CO and VOC shall be determined by stack testing. All other emission limits are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits shall be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Condition numbers 2 through 8, 17, 19 and 20.
(9 VAC 5-50-260 and 9 VAC 5-50-180)

23. **Plant-wide Emission Limits -** Total emissions from the facility whether it is operated in the single fuel or the dual fuel mode shall not exceed the limits specified below, calculated monthly as the sum of each consecutive 12-month period:

Particulate Matter	52.9	lb/hour	125.4	tons/year
PM-10	52.9	lb/hour	125.4	tons/year
PM-2.5	52.9	lb/hour	125.4	tons/year
Sulfur Dioxide	88.2	lb/hour	30.7	tons/year
Nitrogen Dioxide	383.0	lb/hour	240.0	tons/year
Carbon Monoxide	381.8	lb/hour	240.0	tons/year
Volatile Organic Compounds	70.6	lb/hour	167.2	tons/year

Emissions limits are derived from the estimated overall emission contribution from operating limits. Exceedance of the operating limits shall be considered credible evidence of the exceedance of emission limits. Compliance with these emission limits may be determined as stated in Condition numbers 2 through 8, 17, 18, 19 and 20.
(9 VAC 5-50-260 and 9 VAC 5-50-180)

24. **Visible Emission Limit -** Visible emissions from the 48 dual-fuel diesel engines (A1-H6) stacks (S1-S8) shall not exceed 10% opacity whenever the engines are operated in a single fuel mode except during one six-minute period in any one hour in which visible emissions shall not exceed 20% opacity. Visible emissions from the 48 dual-fuel diesel engines (A1-H6) stacks (S1-S8) shall not exceed 20% opacity whenever the engines are operated in a dual fuel mode except during one six-minute period in any one hour in which visible emissions shall not exceed 30% opacity. All visible emissions rates shall be determined by EPA Method 9 (reference 40 CFR 60, Appendix A). This condition applies at all times except during setup, shutdown, and malfunction.
(9 VAC 5-50-80 and 9 VAC 5-50-260)

RECORDS

25. **On Site Records -** The facility shall maintain records of emission data and operating parameters as necessary to demonstrate compliance with this permit. The content and format of such records shall be arranged with the Director, Piedmont Region. These records shall include, but are not limited to:

    a. Annual throughput of landfill gas, distillate oil, and number 4 fuel oil, calculated monthly as the sum of each consecutive 12-month period;

    b. Daily records of fuel consumption for every period of operation to verify compliance with Condition numbers 5, 9, 12, and 18;

    c. Daily records of treated landfill gas heat input as the ratio of total heat input for every period of continuous operation to verify compliance with Conditions 5 and 18. Heat input calculations shall be based on the data required by Condition 12;

    d. Daily log of the polishing tank observation results as described in Condition 31.

    e. Hourly records of engine inlet charge-air temperature reading to verify compliance with Condition 3;

    f. All 1 hour periods of operation during which the charge-air temperature as described in Condition 3 exceeds the average charge-air temperature limit of 140°F;

g. Monthly and annual emission (in tons) using calculation methods approved by the Piedmont Regional Office to verify compliance with emission limitations in Conditions 18, 22, and 23. Annual emissions shall be calculated monthly as the sum of each consecutive 12-month period;

h. Treated landfill gas transport system pressure readings to verify compliance with Condition 14;

i. Weekly landfill gas gross calorific value determination results, including % methane readings as described in Condition 15;

j. Results of all stack tests, visible emission evaluations, monthly visible emission evaluations log and performance evaluations;

k. All fuel supplier certifications;

l. Scheduled and unscheduled maintenance on the engines;

m. Operating procedures and operator training records for the engines;

n. All records generated by the device installed for the purpose of continuously monitoring and recording the status of the device used to divert the collected landfill gas from a utility flare to the landfill gas treatment system and then to the engines (A1-H6), as required by Condition 4.

These records shall be available for inspection by the DEQ and shall be current for the most recent five years.
(9 VAC 5-50-50, 9VAC 5-50-410)

INITIAL COMPLIANCE DETERMINATION

26. **Stack Test -** Initial and subsequent performance tests shall be conducted for NOx and CO from the 48 dual-fuel diesel engines (A1-H6) to determine compliance with the emission limits contained in Conditions 18, 22 and 23. The tests shall be performed while operating in **single fuel mode using 100% distillate oil**. The tests shall be performed at no less than 80% of the rated capacity of the electrical output on a minimum of one set of six engines. The tests shall be performed, and demonstrate compliance within 60 days after achieving the maximum production rate at which the facility will be operated but in no event later than 180 days after start-up of the permitted facility. The tests shall be conducted and reported and data reduced as set forth in 9 VAC 5-50-30 and the test methods and procedures contained in each applicable section or subpart listed in 9 VAC 5-50-410. The details of the tests are to be arranged with the Director, Piedmont Region. The facility shall submit a test protocol at least 30 days prior to testing. Two copies of the test results shall be submitted to the Director, Piedmont Region within 60 days after test completion and shall conform to the test report format enclosed with this permit.
(9 VAC 5-50-30 and 9 VAC 5-50-20, 9 VAC 5-50-30, 9 VAC 5-50-410 and 9 VAC 5-80-1200)

27. **Stack Test -** Initial and subsequent performance tests shall be conducted for **NOx, CO, VOC and PM10,** pollutant emissions from the 48 dual-fuel diesel engines (A1-H6) to determine compliance with the emission limits contained in Conditions 18, 22 and 23. The tests shall be performed while operating in **dual fuel mode using distillate oil and the maximum landfill gas substitution rate achieved during testing**. The dual fuel tests shall be performed at no less than 65% of the rated capacity of the electrical output on a minimum of one set of six engines at two points between 70% and 96% gas fraction on a Btu basis **with one point within 4% of the 96% end point**. The tests shall be performed, and demonstrate compliance within 60 days after achieving the maximum production rate at which the facility will be operated, but in no event later than 180 days **after start-up of the permitted facility**. The tests shall be conducted and reported and data reduced as set forth in 9 VAC 5-50-30 and the test methods and procedures contained in each applicable section or subpart listed in 9 VAC 5-50-410. The details of the tests are to be arranged with the Director, Piedmont Region. The facility shall submit a test protocol at least 30 days prior to testing. Two copies of the test results shall be submitted to the Director, Piedmont Region within 60 days after test completion and shall conform to the test report format enclosed with this permit.
(9 VAC 5-50-30 and 9 VAC 5-50-20, 9 VAC 5-50-30, 9 VAC 5-50-410 and 9 VAC 5-80-1200)

28. **Stack Test -** An initial performance test shall be conducted for nitrogen oxides and carbon monoxide from the 48 dual-fuel diesel engines (A1-H6), within 60 days of the Piedmont Regional Office receiving notice of the combustion of #4 fuel oil, to determine compliance with the emission limits contained in Conditions 18, 22 and 23. Separate tests shall be performed while operating in **single fuel mode using 100% Bio-diesel fuel oil and in dual fuel mode using various quantities of landfill gas and Bio-diesel fuel oil**. The Bio-diesel fuel oil test shall be performed at no less than 80% of the rated capacity of the electrical output on a minimum of one set of six engines. The dual fuel tests shall be performed at no less than 65% of the rated capacity of the electrical output on a minimum of one set of six engines at two points between 70% and 96% gas fraction on a Btu basis **with one point within 4% of the 96% end point**. The tests shall be conducted and reported and data reduced as set forth in 9 VAC 5-50-30 and the test methods and procedures contained in each applicable section or subpart listed in 9 VAC 5-50-410. The details of the tests are to be arranged with the Director, Piedmont Region. The facility shall submit a test protocol at least 30 days prior to testing. Two copies of the test results shall be submitted to the Director, Piedmont Region within 60 days after test completion and shall conform to the test report format enclosed with this permit.
(9 VAC 5-50-30 and 9 VAC 5-50-20, 9 VAC 5-50-30, 9 VAC 5-50-410 and 9 VAC 5-80-1200)

29. **Initial Performance Test** - Concurrently with the initial and subsequent performance test as required in Conditions 26, 27 and 28, the facility shall determine the moisture content of the treated landfill gas, as sampled, prior to combustion in any of the 48 dual-fuel diesel engines (A1-H6). The moisture content testing shall be conducted in accordance with 40 CFR Part 60, Appendix A, Method 4. Each test shall be reported and data reduced as set forth in 9 VAC 5-50-30 and the test methods and procedures contained in each applicable section or subpart listed in 9 VAC 5-50-410. The details of the test are to be arranged with the Piedmont Regional Office. The facility shall submit a test protocol at least 30 days prior to testing. Two copies of the test results shall be submitted to the Piedmont Regional Office within 60 days after test completion and shall conform to the test report format enclosed with this permit.
(9 VAC 5-50-30 and 9 VAC 5-50-20, 9 VAC 5-50-30, 9 VAC 5-50-410 and 9 VAC 5-80-1200)

30. **Visible Emissions Evaluation -** Concurrently with the initial and subsequent performance tests required in Conditions 26, 27 and 28, Visible Emission Evaluations (VEE) in accordance with 40 CFR Part 60, Appendix A, Method 9, shall also be conducted by the facility on those engines tested. Each test shall consist of 30 sets of 24 consecutive observations (at 15 second intervals) to yield a six minute average. The details of the tests are to be arranged with the Director, Piedmont Region. The facility shall submit a test protocol at least 30 days prior to testing. The evaluation shall be performed, and reported and demonstrate compliance within 60 days after achieving the maximum production rate at which the facility will be operated but in no event later than 180 days after start-up of the permitted facility. Should conditions prevent concurrent opacity observations, the Director, Piedmont Region shall be notified in writing, within seven days, and visible emissions testing shall be rescheduled within 30 days. Rescheduled testing shall be conducted under the same conditions (as possible) as the initial performance tests. Two copies of the test result shall be submitted to the Director, Piedmont Region within 60 days after test completion and shall conform to the test report format enclosed with this permit.
(9 VAC 5-50-30 and 9 VAC 5-50-20, 9 VAC 5-50-30, 9 VAC 5-50-410 and 9 VAC 5-80-1200)

CONTINUING COMPLIANCE DETERMINATION

31. **Treated Landfill Gas Moisture Content** - The facility shall drain the polishing tank referenced in Condition 20 at least once each day that landfill gas is consumed by the facility, and observe the presence or absence of any water collected in the tank. The facility shall maintain a daily log of these observations, which shall include the date and time of each observation.
(9 VAC 5-50-20 E, 9 VAC 5-50-30 G, 9 VAC 5-80-1180 and 9 VAC 5-170-160)

32. **Performance Validation Testing** - The performance tests required in Conditions 26 and 27 shall at a minimum be conducted once every five years on all eight stacks and before the operating permit renewal application for NOx and CO, starting from the completion date of the testing as required in Condition 26 and 27. Each testing cycle shall evaluate the performance of a different set of six engines (stack) to ensure the accuracy of the equations in Condition 18. **Separate tests shall be performed while operating in single fuel mode using 100% liquid fuel and in dual fuel mode using various quantities of landfill gas and liquid fuel.** The single fuel oil test shall be performed at no less than 80% of the rated capacity of the electrical output on a minimum of one set of six engines. The dual fuel tests shall be performed at no less than 65% of the rated capacity of the electrical output on a minimum of one set of six engines at two points between 70% and 96% gas fraction on a Btu basis **with one point within 4% of the 96% end point**. The tests shall be conducted and reported and data reduced as set forth in 9 VAC 5-50-30 and the test methods and procedures contained in each applicable section or subpart listed in 9 VAC 5-50-410. The details of the tests are to be arranged with the Director, Piedmont Region. The facility shall submit a test protocol at least

30 days prior to testing. Two copies of the test results shall be submitted to the Director, Piedmont Region within 60 days after test completion and shall conform to the test report format enclosed with this permit.
(9 VAC 5-50-30 and 9 VAC 5-50-20, 9 VAC 5-50-30, 9 VAC 5-50-410 and 9 VAC 5-80-1200)

33. **Test/Monitoring Ports -** The permitted facility shall be constructed so as to allow for emissions testing and monitoring upon reasonable notice at any time, using appropriate methods. This includes constructing the facility such that volumetric flow rates and pollutant emission rates can be accurately determined by applicable test methods and providing stack or duct that is free from cyclonic flow. Test ports shall be provided when requested at the appropriate locations.
(9 VAC 5-50-30 F)

34. **Visible Emissions Evaluations: Continuing Compliance** – Once per month, the facility shall conduct an observation of the presence of visible emissions from the operating 48 internal combustion engines (A1-H6). If visible emissions are observed, the facility shall take timely corrective action such that the units resume operation with no visible emissions, or perform a visible emissions evaluation (VEE) in accordance with 40 CFR 60, Appendix A, Method 9 to assure visible emissions from any of the 48 internal combustion engines (A1-H6) does not exceed 10% opacity whenever the engines are operated in a single fuel mode, except during one six-minute period in any one hour in which visible emissions shall not exceed 20% opacity and visible emissions from the 48 dual-fuel diesel engines (A1-H6) stacks (S1-S8) shall not exceed 20% opacity whenever the engines are operated in a dual fuel mode except during one six-minute period in any one hour in which visible emissions shall not exceed 30.0% opacity. The VEE shall be conducted for a minimum of six minutes. If any of the observation exceeds 10% opacity, the VEE shall be conducted for sixty minutes. If compliance is not demonstrated by the VEE, timely corrective action shall be taken such that the operating engines resumes operation that is in compliance with the opacity limit for single or dual fuel mode as appropriate. The facility shall maintain an observation log to demonstrate compliance. The log shall include the date and time of the observation, single or dual fuel operations, whether or not there were visible emissions, any VEE recordings and necessary corrective actions. Upon request by the DEQ, the facility shall conduct additional visible emission evaluations from the 48 internal combustion engines (A1-H6) to demonstrate compliance with the visible emission limits contained in this permit. The details of the tests shall be arranged with the Director, Piedmont Region.
(9 VAC 5-170-160, 9 VAC 5-50-30 G, 9 VAC 5-50-50 and 9 VAC 5-50-410)

NOTIFICATIONS

35. **Initial Notifications** - The facility shall furnish written notification to the Director, Piedmont Region:

    a. The actual date on which the installation of the 36 engines (A1-F6) are installed within 30 days after such date.

    b. The anticipated start-up date of the engines (A1-F6) postmarked not more than 60 days nor less than 30 days prior to such date.

    c. The actual start-up date of the additional engines (A1-F6) within 15 days after such date.

    d. The anticipated date of performance tests of the dual-fuel electrical power generating plant postmarked at least 30 days prior to such date.

    e. The actual date on which the installation of the additional 12 engines (G1-H6) are installed within 30 days after such date.

    f. The anticipated start-up date of the additional engines (G1-H6) postmarked not more than 60 days nor less than 30 days prior to such date.

    g. The actual start-up date of the additional engines (G1-H6) within 15 days after such date.

    (9 VAC 5-50-50)

36. **Control Equipment Removal Notification -** The facility shall furnish notification to the Director, Piedmont Region of the date of removal or cessation of operation of the control equipment 30 days prior to such date.
    (9 VAC 5-50-410)

37. **Notification for Facility or Control Equipment Malfunction -** The facility shall furnish notification to the Director, Piedmont Region of malfunctions of the affected facility or related air pollution control equipment that may cause excess emissions for more than one hour, by facsimile transmission, telephone or telegraph. Such notification shall be made as soon as practicable but not later than four daytime business hours of the malfunction. The facility shall provide a written statement giving all pertinent facts, including the estimated duration of the breakdown, within 14 days of the occurrence. When the condition causing the failure or malfunction has been corrected and the equipment is again in operation, the facility shall notify Director, Piedmont Region in writing.
    (9 VAC 5-20-180 C)

38. **Permit Invalidation** - This permit to construct a dual-fuel electrical power generation facility shall become invalid, unless an extension is granted by the DEQ, if:

    a. A program of continuous construction is not commenced before the latest of the following:

        (1) 18 months from the date of this permit;

        (2) Nine months from the date that the last permit or other authorization was issued from any other governmental agency;

        (3) Nine months from the date of the last resolution of any litigation concerning any such permits or authorization; or

    b. A program of construction is discontinued for a period of 18 months or more, or is not completed within a reasonable time, except for a DEQ approved period between phases of a phased construction project.

    (9 VAC 5-80-1210)

39. **Emissions evaluation for Phased Construction** - The modifications associated with this permit resulted in a total facility-wide permitted emissions increase of 240.0 tons per year of CO, 240.0 tons per year of NOx, 125.4 tons per year PM/PM_{10}/ $PM_{2.5}$, 30.7 tons per year SO_2 and 167.2 tons per year VOC. Any application for construction, reconstruction, or modification of this facility submitted subsequent to the application dated April 26, 2007 received by DEQ shall include an analysis of the effect of the construction, reconstruction, or modification on the facility-wide emissions and a determination of the effect of the project on plant-wide production capacity. Further emissions increases related to this construction, reconstruction, or modification shall be evaluated together with the above emission increases to determine whether such activities are subject to any applicable provisions of 9 VAC 5 Chapter 80, Articles 6, 8 and 9 of the State Regulations.
    (9 VAC 5-80-1100, 9 VAC 5-80-1700 and 9 VAC 5-80-2000)

40. **BACT evaluation for Phased Construction** - The emission controls required by this permit will be reevaluated in conjunction with future submittals related to the phased construction activities covered in this permit no later than 18 months prior to the commencement of construction for each phase of the project. Future emission reduction strategies determined to be applicable to future phased construction activities may require amending this permit.
    (9 VAC 5-80-1100, 5-50-280 D)

GENERAL CONDITIONS

41. **Right of Entry** - The facility shall allow authorized local, state and federal representatives, upon the presentation of credentials:

    a. To enter upon the premises on which the facility is located or in which any records are required to be kept under the terms and conditions of this permit;

    b. To have access to and copy at reasonable times any records required to be kept under the terms and conditions of this permit or the State Air Pollution Control Board Regulations;

    c. To inspect at reasonable times any facility, equipment, or process subject to the terms and conditions of this permit or the State Air Pollution Control Board Regulations; and

    d. To sample or test at reasonable times.

    For purposes of this condition, the time for inspection shall be deemed reasonable during regular business hours or whenever the facility is in operation. Nothing contained herein shall make an inspection time unreasonable during an emergency.
    (9 VAC 5-170-130)

42. **Violation of Ambient Air Quality Standard** - The facility shall, upon request of the DEQ, reduce the level of operation or shut down a facility, as necessary to avoid violating any primary ambient air quality standard and shall not return to normal operation until such time as the ambient air quality standard will not be violated.
    (9 VAC 5-20-180 I)

43. **Maintenance/Operating Procedures** - The facility shall take the following measures in order to minimize the duration and frequency of excess emissions, with respect to air pollution control equipment, monitoring devices, and process equipment which affect such emissions:

    a. Develop a maintenance schedule and maintain records of all scheduled and non-scheduled maintenance.

    b. Maintain an inventory of spare parts.

    c. Have available written operating procedures for equipment. These procedures shall be based on the manufacturer's recommendations, at a minimum.

d. Train operators in the proper operation of all such equipment and familiarize the operators with the written operating procedures. The facility shall maintain records of the training provided including the names of trainees, the date of training and the nature of the training.

Records of maintenance and training shall be maintained on site for a period of five years and shall be made available to DEQ personnel upon request.
(9 VAC 5-50-20 E)

44. **Permit Suspension/Revocation** - This permit may be suspended or revoked if the facility:

a. Knowingly makes material misstatements in the application for this permit or any amendments to it;

b. Fails to comply with the conditions of this permit;

c. Fails to comply with any emission standards applicable to the equipment listed in Condition 1;

d. Causes emissions from this facility which result in violations of, or interferes with the attainment and maintenance of, any ambient air quality standard;

e. Fails to operate this facility in conformance with any applicable control strategy, including any emission standards or emission limitations, in the State Implementation Plan in effect on the date that the application for this permit is submitted;

f. Fails to construct or operate this facility in accordance with the application for this permit or any amendments to it; or

g. Allows the permit to become invalid.

(9 VAC 5-80-1210)

45. **Change of Ownership** - In the case of a transfer of ownership of a stationary source, the new owner shall abide by any current permit issued to the previous owner. The new owner shall notify the Director, Piedmont Region of the change in ownership within 30 days of the transfer.
(9 VAC 5-80-1240)

46. **Registration/Update** - Annual requirements to fulfill legal obligations to maintain current stationary source emissions data will necessitate a prompt response by the facility to requests by the DEQ or the board for information to include, as appropriate: process and production data; changes in control equipment; and operating schedules. Such requests for information from the DEQ will either be in writing or by personal contact. The availability of information submitted to the DEQ or the board will be governed by applicable provisions of the Freedom of Information Act, §§ 2.1-340 through 2.1-348 of the Code of Virginia, § 10.1-1314 (addressing information provided to the board) of the Code of Virginia, and 9 VAC 5-170-60 of the State Air Pollution Control Board Regulations. Information provided to federal officials is subject to appropriate federal law and regulations governing confidentiality of such information.
(9 VAC 5-20-160 and 9 VAC 5-170-60)

47. **Permit Copy** - The facility shall keep a copy of this permit on the premises of the facility to which it applies.
(9 VAC 5-170-160)

SOURCE TESTING REPORT FORMAT

Cover

1. Plant name and location
2. Units tested at source (indicate Ref. No. used by source in permit or registration)
3. Tester; name, address and report date

Certification

1. Signed by team leader / certified observer (include certification date)
* 2. Signed by reviewer

Introduction

1. Test purpose
2. Test location, type of process
3. Test dates
* 4. Pollutants tested
5. Test methods used
6. Observers' names (industry and agency)
7. Any other important background information

Summary of Results

1. Pollutant emission results / visible emissions summary
2. Input during test vs. rated capacity
3. Allowable emissions
* 4. Description of collected samples, to include audits when applicable
5. Discussion of errors, both real and apparent

Source Operation

1. Description of process and control devices
2. Process and control equipment flow diagram
3. Process and control equipment data

* Sampling and Analysis Procedures

1. Sampling port location and dimensioned cross section
2. Sampling point description
3. Sampling train description
4. Brief description of sampling procedures with discussion of deviations from standard methods
5. Brief description of analytical procedures with discussion of deviation from standard methods

Appendix

* 1. Process data and emission results example calculations
2. Raw field data
* 3. Laboratory reports
4. Raw production data
* 5. Calibration procedures and results
6. Project participants and titles
7. Related correspondence
8. Standard procedures

* Not applicable to visible emission evaluation